Wind Turbine Certification and One-stop Solution

Miranda Chen
General Manager

TÜV Rheinland Greater China



Content





1872
Founded to ensure the safety of manufacturing plants

1904
First vehicle inspection

1908
First elevator inspection

1955
First product certification

2001
First internet-based certification database

2009
Global market leader in photovoltaic certification

2012
New test mark with QR code for fast research and more transparency

2014
One of the biggest independent service providers for ICT security

2017
Center of Excellence Wireless Internet of Things (IoT)

Milestones of a long tradition

TÜV Rheinland – originator of many TIC services



We ensure quality & safety

6 Business Streams

27 Business Fields

INDUSTRIAL SERVICES
- Pressure Equipment
- Lifting Equipment & Machinery
- Electrical Engineering & Automation
- Industrial Inspection
- Infrastructure & Civil Engineering
- Energy & Environment
- Project Management
- Materials Testing & NDT

MOBILITY
- Periodical Technical Inspection
- Driver's License
- Car Services & Appraisal
- Engineering & Type Approval
- Rail

PRODUCTS
- Softlines
- Hardlines
- Electrical
- Commercial
- Medical
- Solar

ACADEMY & LIFE CARE
- Occupational Health & Safety
- Training & HR Development
- Labour Market Services & Private Schools

DIGITAL TRANSFORMATION & CYBERSECURITY
- Cybersecurity
- Digital Transformation

SYSTEMS
- Certification of Management Systems
- Customized Services
- Government Inspections & International Trade



700 Elevator inspections/day

10 Mill. vehicle inspections/year

12,000 Learning opportunities/year

Testing, inspecting, certifying, consulting, training:
In the TIC market, we operate as a worldwide active partner.



Corporate Value

INTEGRITY

We are incorruptible and act with fairness.

EXCELLENCE

We achieve excellence in all our processes and products.

CUSTOMER ORIENTATION

We put the needs of our customers first.

PERFORMANCE

We are performance oriented and accept responsibility.

AGILITY

We are agile, flexible, and responsive in a changing world.



20,450 EMPLOYEES

Hand in hand with specialists, auditors, examiners, engineers – the qualifications of our employees are as diverse as our tasks.

	GERMANY	INTERNATIONAL	
2018	8,795	11,665	20,450
2017	8,504	11,420	19,924



German at heart – global in mind.

56 COUNTRIES

>500 LOCATIONS

600 ACCREDITATIONS

227 LABORATORIES

80 countries/accreditations by authorities for Market Access Service



Experience and Development in Wind Energy Sector

~ 2000

Start of Statutory Inspections on WTGs

2010

- Implementation of Central Business Field Wind Energy Operations in Germany
- Accredited (BSH) Project Certification Offshore
- 1st order for Offshore Wind farm, Germany, Project Alpha Ventus

03/2011

- 1st order for Offshore Wind farm Manufacturing Survey Germany, Project NSO

08/2011

- Amendment of Service Portfolio by Marine Warranty Survey Services
- **Germany**
  Strategic cooperation with Eurowind, FGH and University of Aachen

06/2012

- **Accredited 17065 (DAkkS) Product Certification**
  - IEC 61400 series
  - GL Guideline
  - etc.

07/2012

- **Japan**
  Strategic cooperation with Class NK launched

04/2013

- **China**
  Strategic cooperation with CGC launched

12/2013

- **Accredited 17025 (DAkkS) Site services**
  - Energy yield
  - Turbulence
  - Noise emission
  - etc.

05/2015

- **India**
  Strategic cooperation with NIWE (C-WET) launched

02/2016

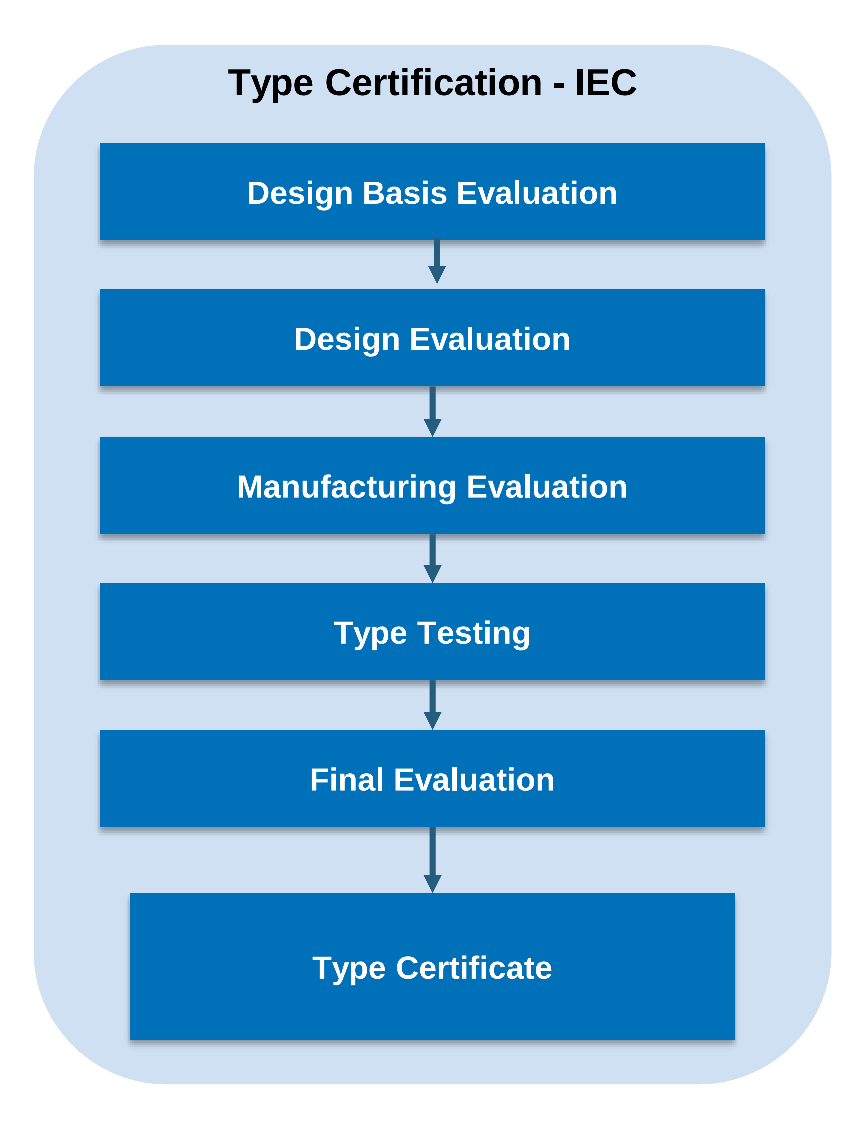
- **Accredited 17065 (DAkkS) Scope extension - Grid Integration**
  - FGW
  - SDLWindV
  - CEA (India)
  - etc.

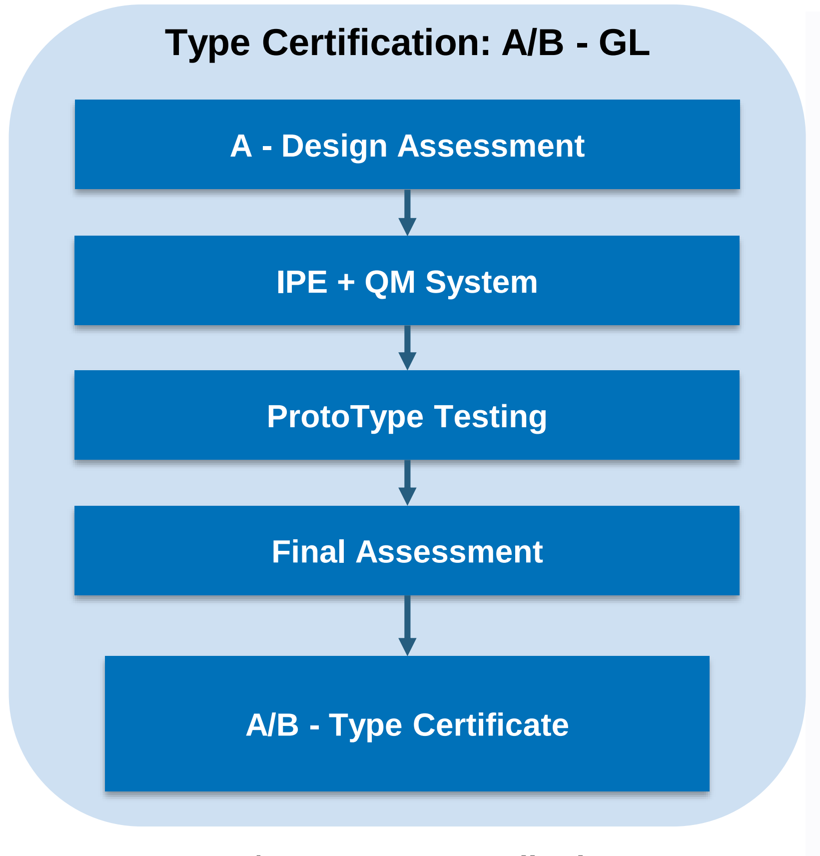
07/2017

- **Accredited 17065 (IECRE) Product Certification**



Certification Process - Type Certification







Certificate

Type Certificate for a Wind Turbine

according to IEC 61400-22

Certificate No.:	**999999-999**
Name and Address of Manufacturer:	**Mustermann Company** **Musterstrasse** **Musterort** **Germany**
Type of Wind Turbine:	Type-No. Determination of Wind Turbine Type see page 2 of Certificate.
Field of application:	This Certificate confirms the conformity with IEC 61400-1, Class xx, additional specifications in terms of construction and manufacturing. Verification of Conformity according to IEC 61400-22.
Referred documents:	The Certification is based on the following documents: - Statement of Conformity for Construction Evaluation (No., Date) - Statement of Conformity for Type Testing (No., Date) - Statement of Conformity for Manufacturing (No., Date) - Statement of Conformity for Evaluation of Foundation Design (No., Date) - Statement of Conformity for Evaluation of Manufacturing of Foundation (No., Date) - Statement of Conformity for Type Specific Values (No., Date) - Report of Final Evaluation (No., Date)
Valid until:	09/17/201x

Cologne, 09/17/201x

TÜV Rheinland Industrie Service GmbH
Am Grauen Stein, D-51105 Cologne

Certification Body for Wind Turbines, accredited according to EN 45011

www.tuv.com

TÜVRheinland®
Precisely Right.

- **DAKKS ISO/IEC 17065 Accreditation -** IEC 61400-22:2010, GL 2010, DIBT 2012, BSH Standards, BWE Lifetime extension (request ongoing)
- **IEC RE Accreditation -** Accredited as WE-OMC IEC RE Certification Body (RECB)







Certification Process - Type Certification - IEC 61400-22:2010

Type Certificate

Final Evaluation Report

CS - Design

Design - Evaluation Reports

- Design Basis
- Control and protection system
- Loads and load cases
- Rotor blade
- Machinery parts + Gearbox workshop & field tests
- Electrical parts + Generator workshop test
- Tower & Foundation requirements
- Manuals including processes - Manufacturing, transportation, installation, maintenance etc.

Design + Component Test Except blade

CS - Type Testing

Type Testing - Evaluation Reports

- Rotor blade – Static, Fatigue & Post Fatigue Tests
- Load measurements
- Power performance
- Safety & function Test

- Power quality tests
- Low voltage ride through tests (LVRT)
- Acoustic noise measurements

Wind Turbine Test + Component Test-blade

CS - Manufacturing

Manufacturing - Evaluation Reports

- Rotor blade
- Machinery components (Str. & Buy-out)
- Electrical components
- Tower

Wind Turbine Components Inspection + QM System

Optional Modules



TÜV Rheinland Global Footprint

We continue to invest in our team and its competence as well as in up-to-date equipment and data smart technologies

TÜV Rheinland Wind Energy Services Global Footprint

Germany (HQ*)

Core services:
- Type & Component Certification
- Project Certification
- Site Specific Design Evaluation
- Life Time Extension
- Construction Supervision
- Inspection Services, QA/QC
- Technical Due Diligence

31

China

Core services:
- Inspection Services
- Type Certification - Manufacturing Evaluation
- Project Certification - Manufacturing Surveillance
- Testing Witnessing

30

India

Core services:
- Owner's Engineering
- Lender's Independent Engineering
- Meso-Scale Mapping
- Wind Measurement Campaign
- Wind Resource Assessment
- Technical Due Diligence
- Power Curve Verification Test
- Type & Component Certification

28

Global R&S competence center

Core services:
- Risk & Safety Assessment
- Risk & Safety Management
- Risk & Safety Training

on Wind Turbines / Wind Farm Construction (on - & offshore)

15

WEU Countries (Portugal & Spain)

Core services:
- Manufacturing Inspection on Wind Turbine Components
- Industrial Inspections
- Site Specific Inspections
- Safety Inspection on Wind Turbine Components

12

Turkey

Core services:
- Manufacturing Inspection

1

In addition, TÜV Rheinland also cooperates with selected and highly qualified partners.



Reference


株洲时代新材料科技股份有限公司
ZHUZHOU TIMES NEW MATERIAL TECHNOLOGY CO., LTD.


MINGYANG WIND POWER
PERFORMANCE BY NATURE


上海电气
SHANGHAI ELECTRIC


Pioneer Wincon


SIEMENS Gamesa
RENEWABLE ENERGY


ReGen
POWERTECH


INOXWIND
Energizing INDIA


ZWZ
ROLLING BEARINGS


winergy


moventas


NGC


siva


DELTA
DELTA ENERGY SYSTEMS


LEITWIND


AGILE
WIND POWER


RheinEnergie


CCNM
吉林重通成飞新材料股份公司
JILIN CHONGTONG CHENGFEI NEW MATERIAL CO., LTD.


WINDnovation
Engineering Solutions GmbH




RWE


innogy


TÜVRheinland®
Precisely Right.

Reference


ALSTOM


SETEC
Wind
Power


NORDEX


itec
ITEC International GmbH


acciona
Windpower


ENERTRAG
DIE WINDKRAFT


ADB
ASIAN DEVELOPMENT BANK


Gaia-Wind
GENERATING BETTER VALUE


ecotècnia


PROKON Nord
Energiesysteme GmbH


ReNew
POWER
TRANSFORMING ENERGY


Fuhrländer


EnBW


WINDBROKERS


WINDENERGIE
NEURUPPIN GmbH


EUROWIND
ENERGY GmbH


renovalia
energy


ENERCON
ENERGY FOR THE WORLD


OGP
ORIENT GREEN POWER COMPANY LIMITED


juwi
Energy is here


TÜVRheinland®
Precisely Right.

Reference


WTG
PARTNERS


Centerbridge


SANY


e·on


OEKO
STROUM


HGO
Power of Performance


EnergieKontor


WE4CE


OSTWIND
An Energie gewinnen.


WindEnergie
Jansen


wpd
think energy


EnergieAgentur.NRW
klimaschutz made in nrw


PowerWind


RheinEnergie


ATRIA POWER


AREVA


ELECON
GEARING THE FUTURE


ONP
Management


OWI
Bauträger GmbH & Co. KG


SETEC
Wind
Power


MYTRAH


OSTRO


AGILE
WIND POWER


TÜVRheinland®
Precisely Right.

One-Stop Solution

- Global Headquarter - Cologne
- Certification Body - Cologne
- Competence Centers – Cologne, Hamburg, Nürnberg
- Certification Group - Cologne, Hamburg, Nürnberg, Chennai, Shanghai

No matter how complex your project is – at TÜV Rheinland you find a qualified expert every time.

- **Type & Component Certification**
- **Project Certification**
- **Management System Certification**
- **Project Planning Services**
- **Manufacturing Surveillance**
- **CE Marking**

- **Site Specific Design Evaluation**
- **Technology Selection**
- **Health and Safety**
- **Smart Inspections**
- **Expert Reports**
- **Supplier Mapping**

- **Training and Education**
- **Technical Due Diligence and RCA**
- **Grid Connection**
- **Risk Management**
- **Condition Monitoring**
- **Life Time Extension of Old WTG**



Thank You!

Please contact :

Ms. Irene Chuang

Senior Sales Executive

Mobile: +886-931371787

Office: +886-221721161



